

# 2020 Water Year so far

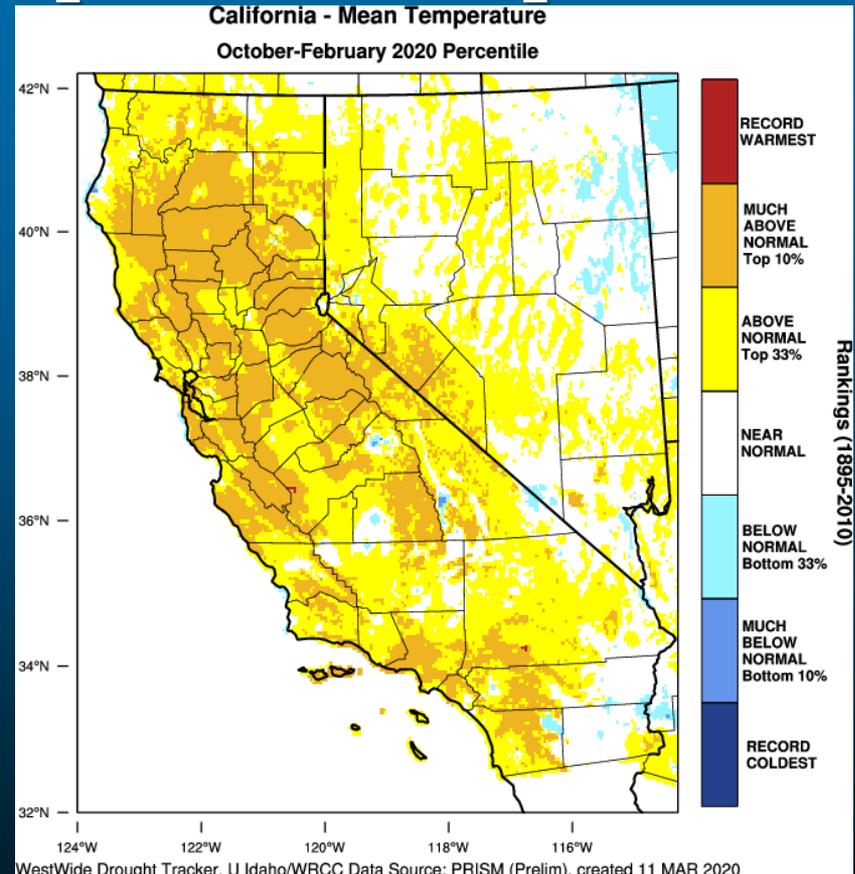
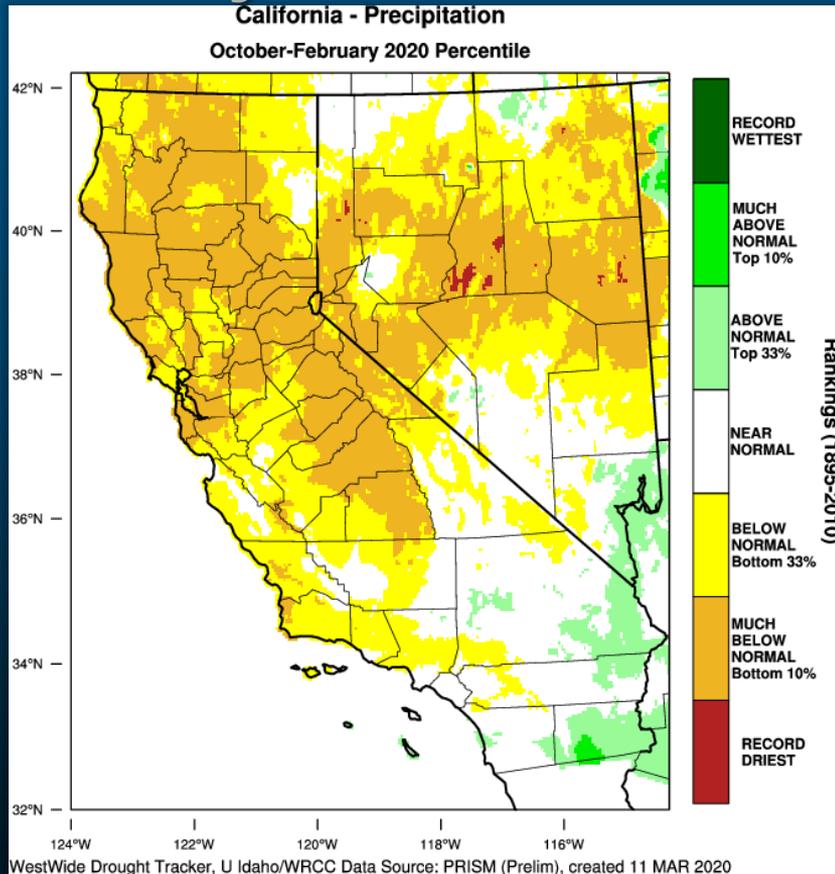
What Winter?  
Time is ticking for a  
Mirical March?

*Tim Bardsley*  
Senior Service Hydrologist – NWS Reno  
[tim.bardsley@noaa.gov](mailto:tim.bardsley@noaa.gov)

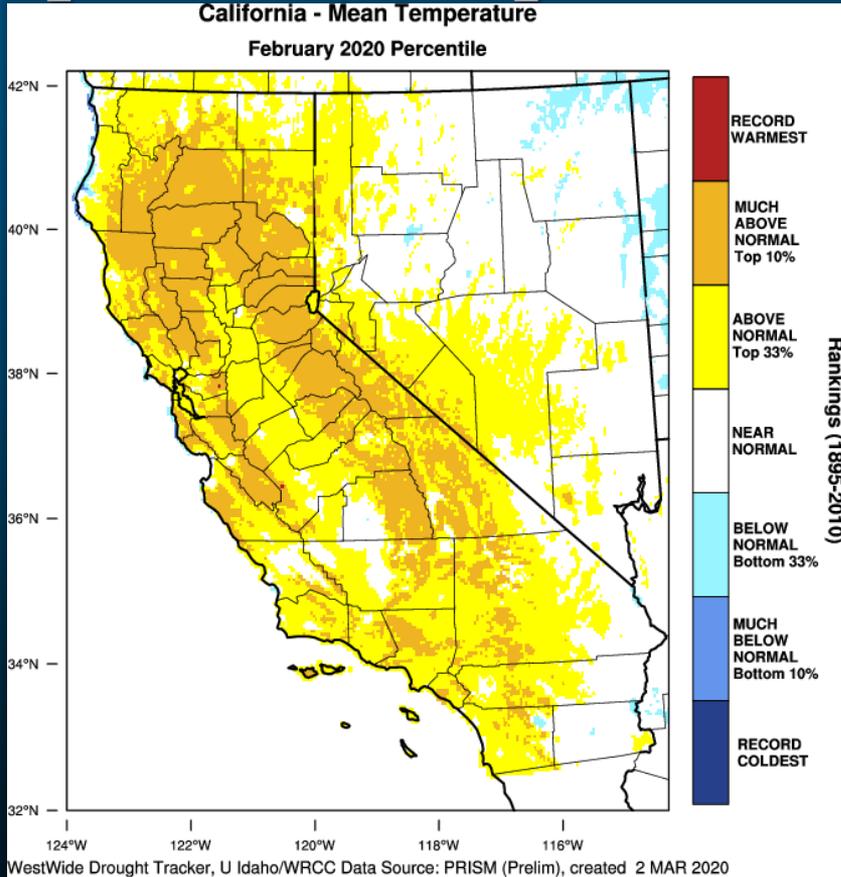
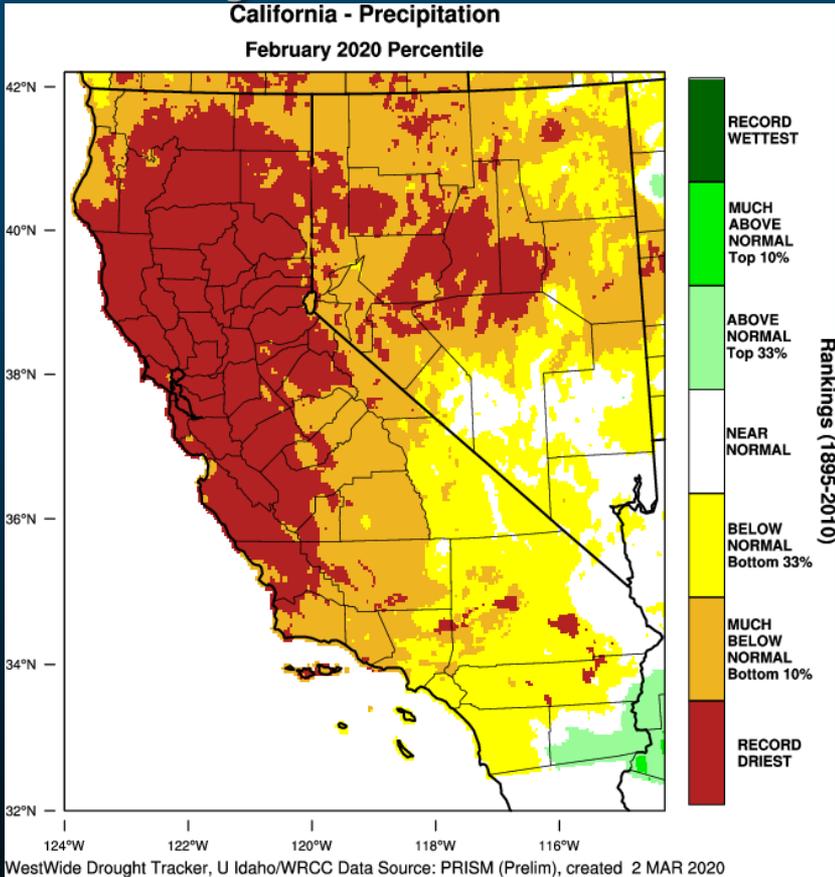


*Peavine burn area*  
*February 27 2020*

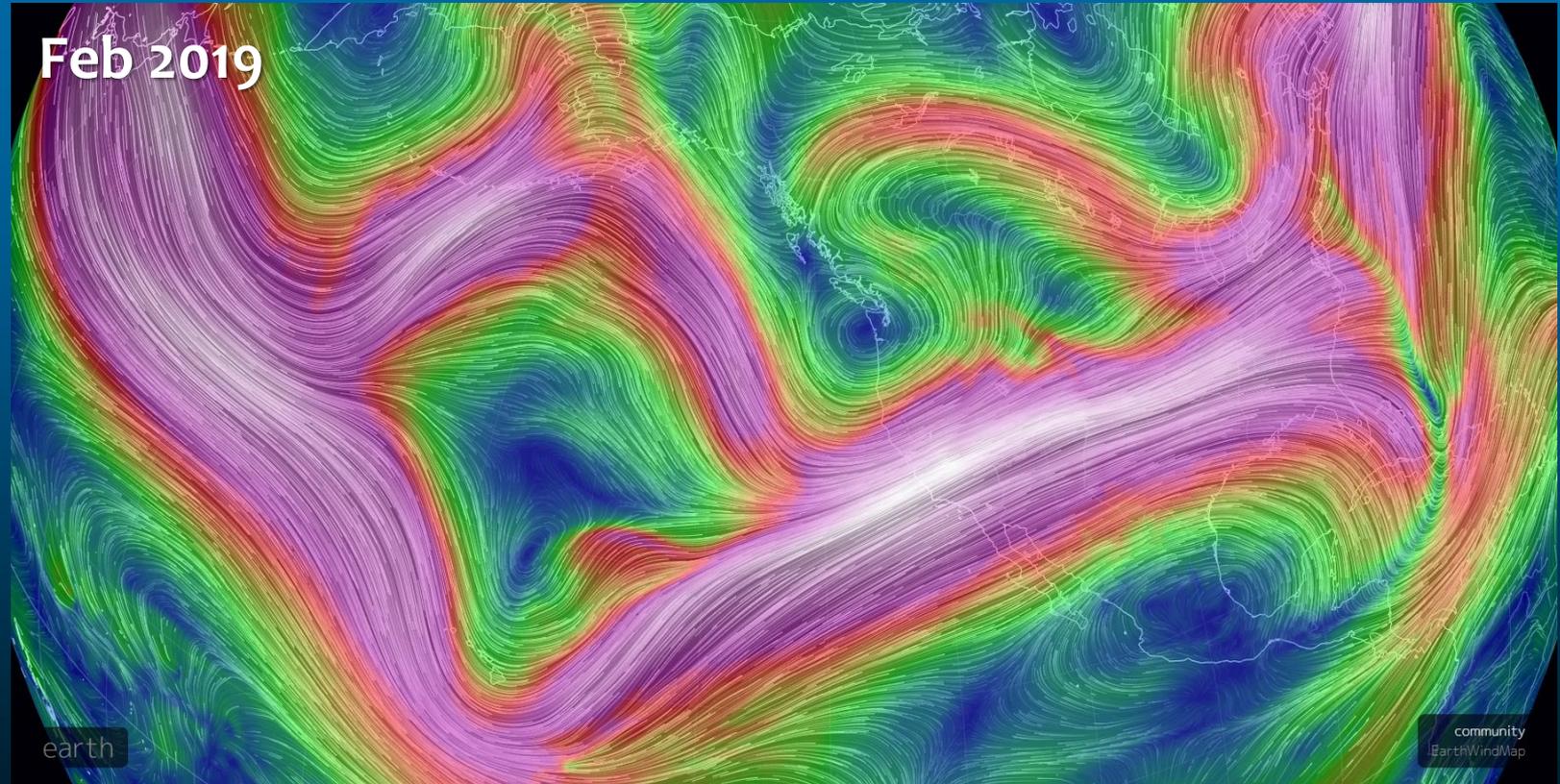
# Water year 2020 Precip and Temp



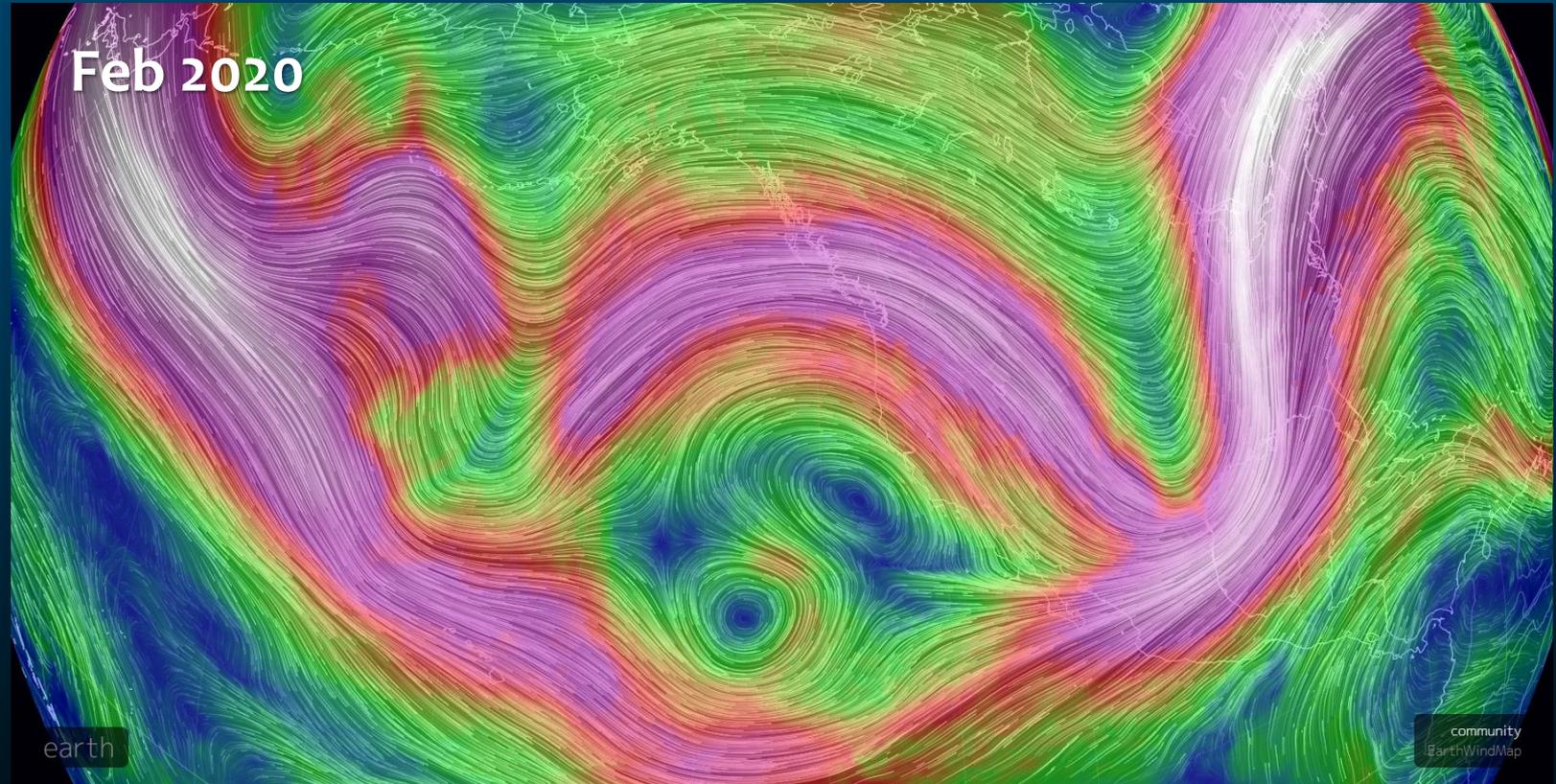
# Water year 2020 Precip and Temp



# 2018-19 vs 2019-20 – Storm Track



# 2018-19 vs 2019-20 – Storm Track



# Situational Awareness - When Should I Freak Out?

NWS Reno 7-14 Day Scan for Unusual Upcoming Weather across the Eastern Sierra and Western Nevada

	Thurs <sup>3/12</sup>	Fri <sup>3/13</sup>	Sat <sup>3/14</sup>	Sun <sup>3/15</sup>	Mon <sup>3/16</sup>	Tues <sup>3/17</sup> 	Wed <sup>3/18</sup>	W2 <sup>3/19-25</sup>	
<b>Wind</b>	Generally light N/NE winds.	SW winds increase Friday PM, becoming strong Fri night thru Sat. Appreciable impacts to travel, aviation, lakes. Isolated damage in wind prone areas.		Continued breezy. Stronger winds for E Sierra, Hwy 95 communities.	Lighter but cool N/NW breezes.		Light winds.	No large storm signals right now, but some simulations show mainly light showers continuing on/off through next week.	
<b>Snow</b>	Calm before the storm? Get your trans-Sierra travel and outdoor prep done by Sat morning.		Snow starting Sat AM in Sierra. Big travel impacts in mountains. W Nev snow mainly Sunday but less certain on road impacts due to "warm" temps. Storm could catch many off-guard with recent dryness.	Sierra snow a good bet, but less certain for W Nev cities. May be rain or snow showers.	Scattered rain/snow showers continue.				
<b>Flooding</b>	No concerns here.								
<b>Unusual Cold or Heat</b>	Amazing. Warm.	Warm but breezier.	Transition day, cooler.	Much colder! Daytime temps 10-15 degrees below normal. Nights quite cold for mid-March. Protect new vegetation.					
<b>Ventilation, Fog</b>	No worries here with good mixing and increasing winds.					Potential for valley inversions but PM mixing should be good.		Slow warming trend to near normal.	
<b>Fire Weather</b>	Low humidity.	Concerns lower elev grassy areas with low RH. Sat risk shifts mainly to E Sierra.		Cool and damp, no issues for a while...					

**What Does This Mean?** Integrates impacts and confidence

No worries



Low freakoutness



Moderate freakoutness



High freakoutness



Really bad



# What We Know, and What We Don't

## What We Know

- ★ Strong winds Friday late afternoon through Saturday - continued high confidence. Travel, recreation, fire impacts.
- ★ Periods of heavy snow virtually certain for the Sierra Saturday into Monday.
- ★ Some periods of wet snow for NE California and Western Nevada cities during that same timeframe.

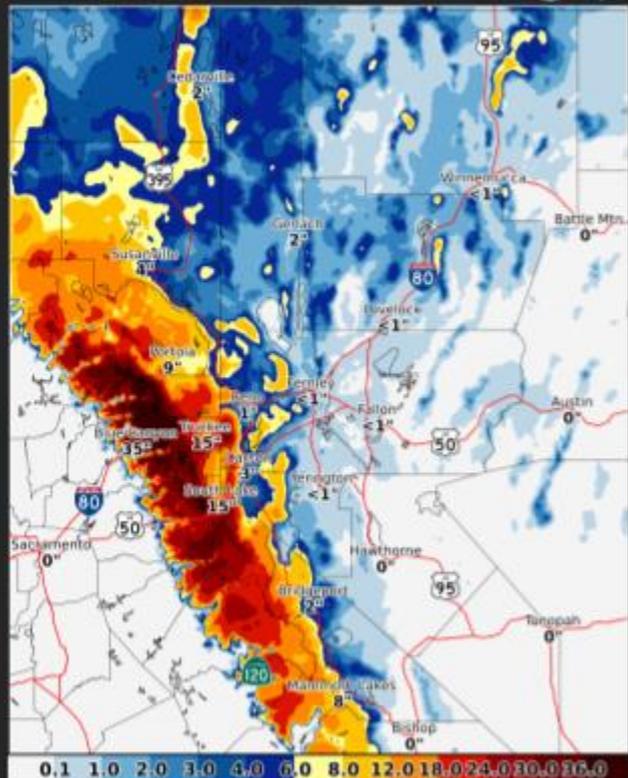
## What We Don't Know

- ★ This weather pattern has some bust potential. Several low pressure areas off the coast sending moisture into our region. Slight track shifts in these lows can result in big snowfall adjustments, especially east of the Sierra crest.
- ★ Impact of “warm” temperatures on road snow accumulations in W Nevada. Simulations have trended a little warmer so that we could even see rain mix in for W Nev cities below 5500 ft. Would mitigate road impacts there.
- ★ How long pattern will stay active. Could see mountain snow continue into Tuesday. Also - some simulations bring rain/snow showers much of next week.

# Significant Snow Saturday through Sunday

## Snowfall - Official Forecast

Saturday Morning through Sunday Night



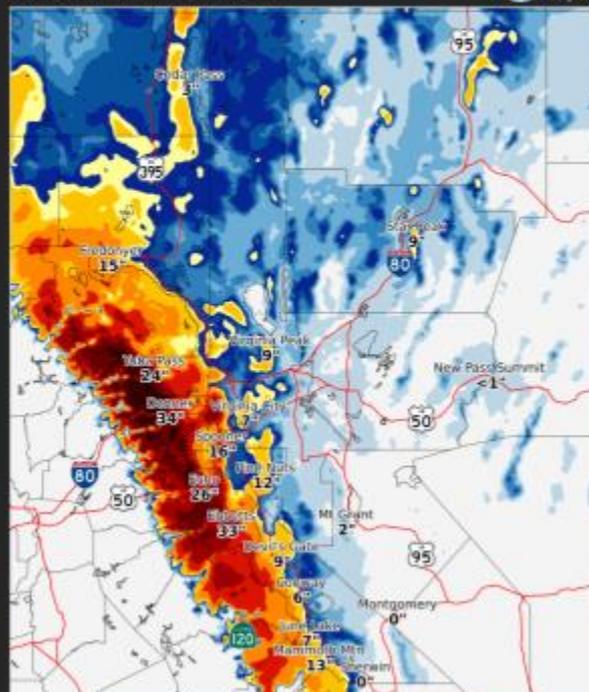
Created: 10:14 AM PDT 03/12/2020

Inches

weather.gov/fore

## Snowfall - Official Forecast (Ridges)

Saturday Morning through Sunday Night



Created: 10:18 AM PDT 03/12/2020

Inches

weather.gov/fore

- Maps show our favored scenario (official forecast) - each map has different cities and passes highlighted.
- Timing info on next slide now.
- Sierra and far W Nevada foothills - high confidence in seeing decent snow. W Nev cities - mixed confidence as usual with trending more to a rain/snow mix below 5500'. Still period of wet snow are likely all areas.
- Wetter snow - ratios 8-12:1
- **Travel impacts likely significant**, especially over the passes, Saturday through Monday. Travel impacts possible for W Nevada cities but less confidence. Road impacts could mainly be at night, early morning hours with colder temps (e.g. Mon AM commute)

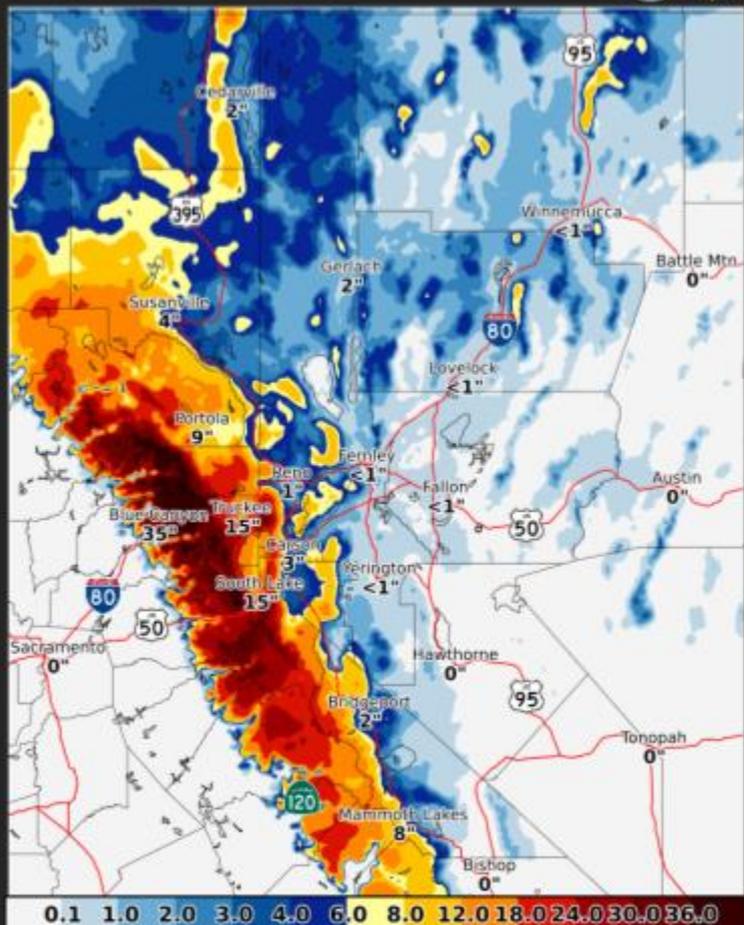
Reno National Weather Service

Forecasting for the Sierra and western Nevada since 1905



## Snowfall - Official Forecast

Saturday Morning through Sunday Night



Created: 10:14 AM PDT 03/12/2020

Inches

weather.gov/reno

# Earliest Snow Onset Timing

**Sat 9AM** Cedarville, Portola, Donner, Truckee, South Lake Tahoe

**Sat 3PM** Susanville, East side of Tahoe, Markleeville

**Sat 9PM** Reno-Sparks and Carson areas above 5500 ft, Virginia City

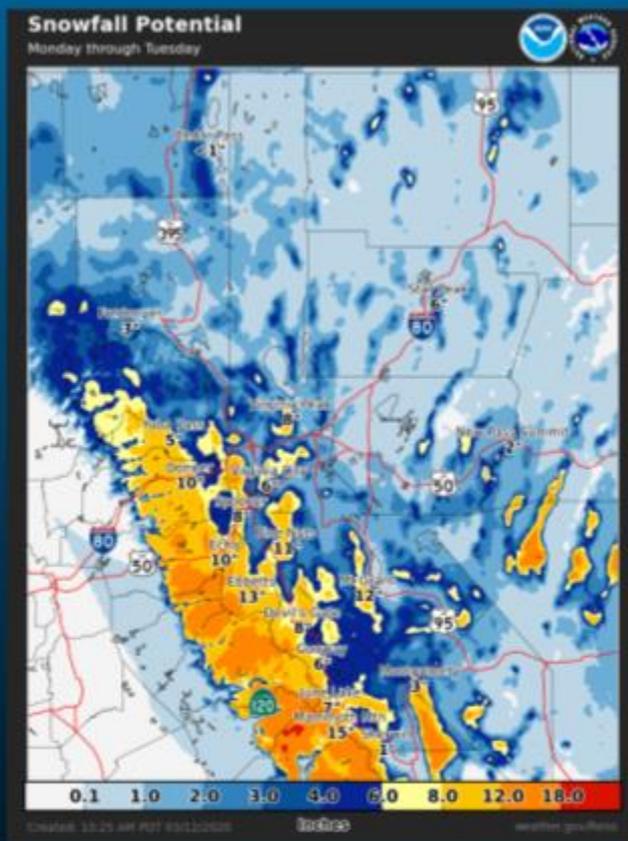
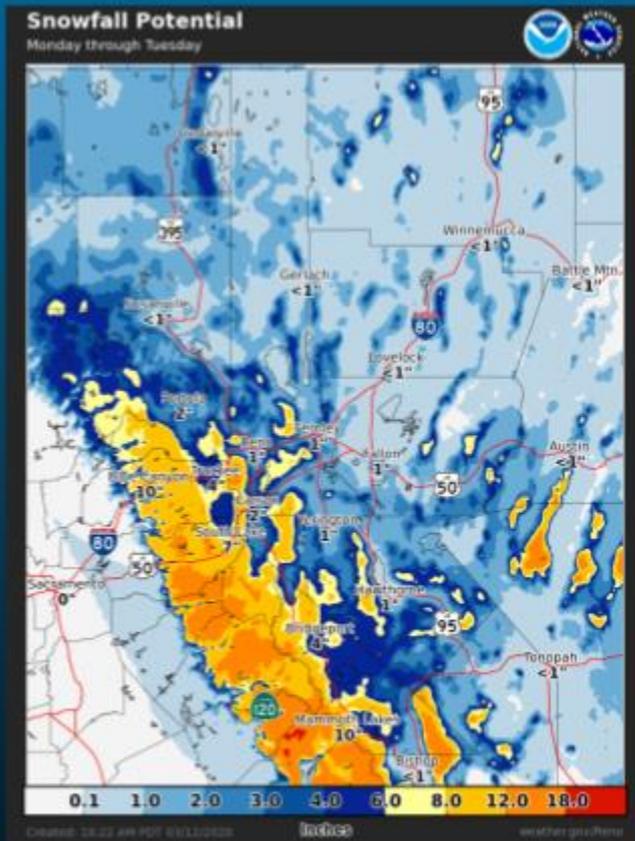
**Sun 3AM** Reno-Sparks and Carson valleys, Fernley, Gerlach, Yerington, Lee Vining, Mammoth

**Sun 12PM** Hawthorne, Fallon, Lovelock

Reno National Weather Service  
Forecasting for the Sierra and western Nevada since 1905

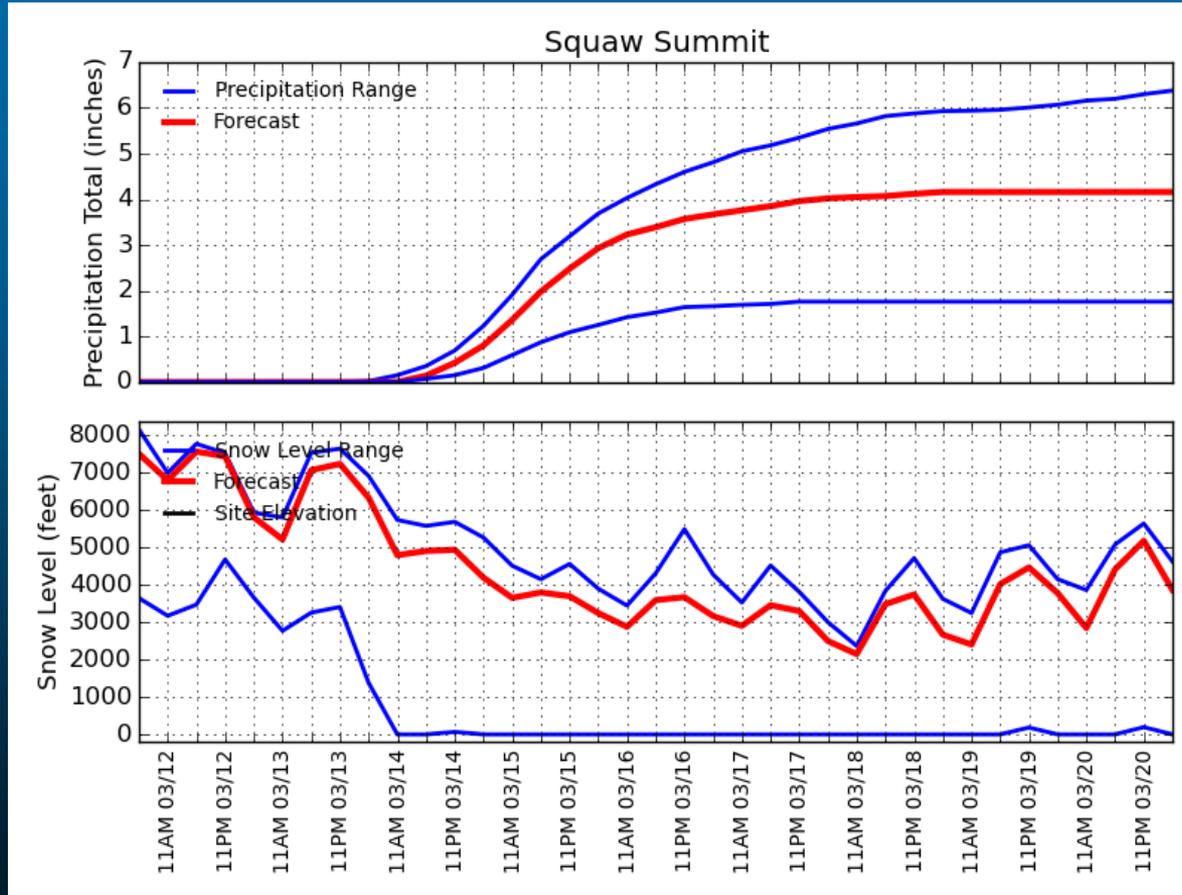


# Good Potential for More Snow Monday-Tuesday



- An increasing number of our simulations show snow lingering into Monday and possibly Tuesday as additional waves of moisture move in. This would prolong travel impacts over the mountains especially at night and in the morning.
- All snow for Sierra. Bouncing between rain and snow for W Nevada valleys and foothills Monday-Tuesday. Could still see travel impacts in W Nevada cities Mon AM and Tues AM when temps are coldest, but trending less likely below 5500'.
- Lots of variability in the simulations for Monday-Tuesday. They've trended wetter but still not a lock on these snowfall scenarios. Rain-snow line elevations will be quite variable.

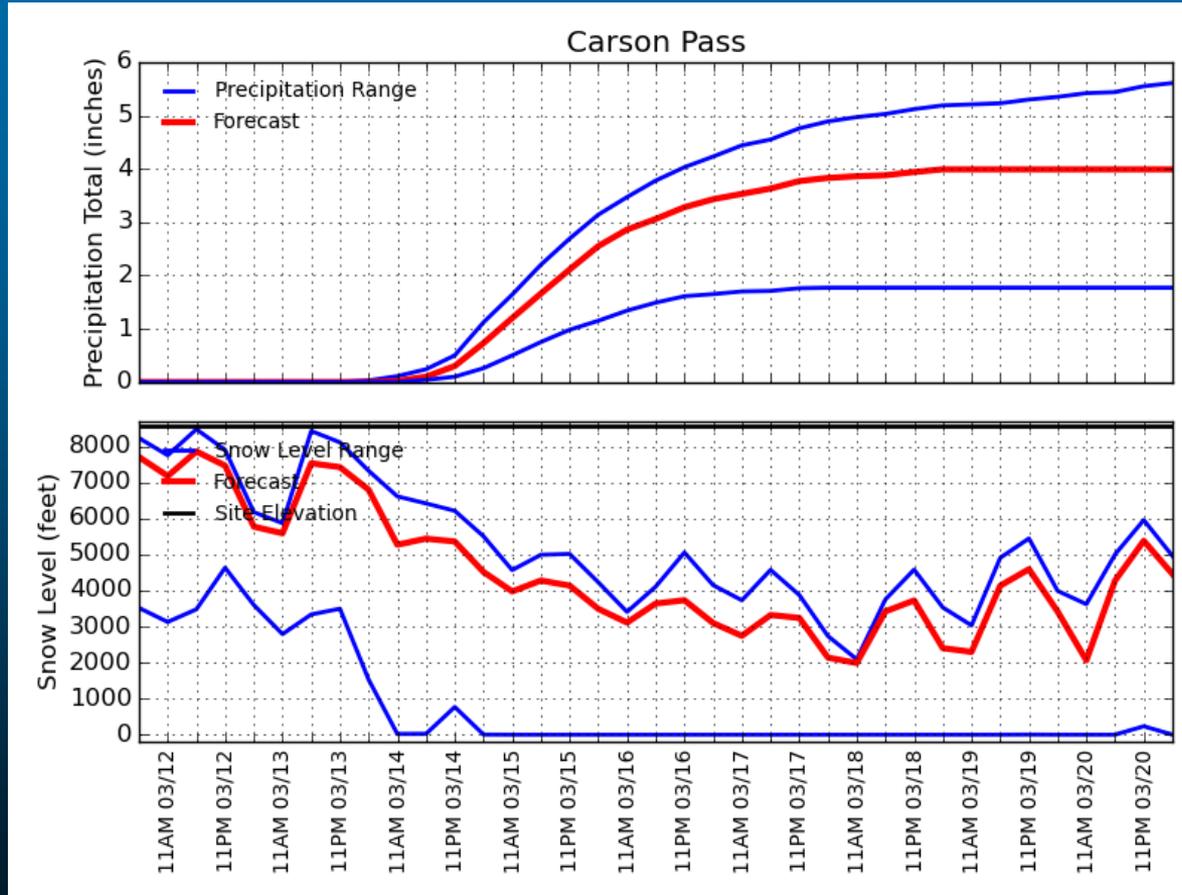
# Water & Snow Level Scenarios



**10 Day Scenarios** - Graphs compare NWS operational forecast (red) with recent model simulation scenarios in blue. Greater spread between the lines - means less forecast certainty.

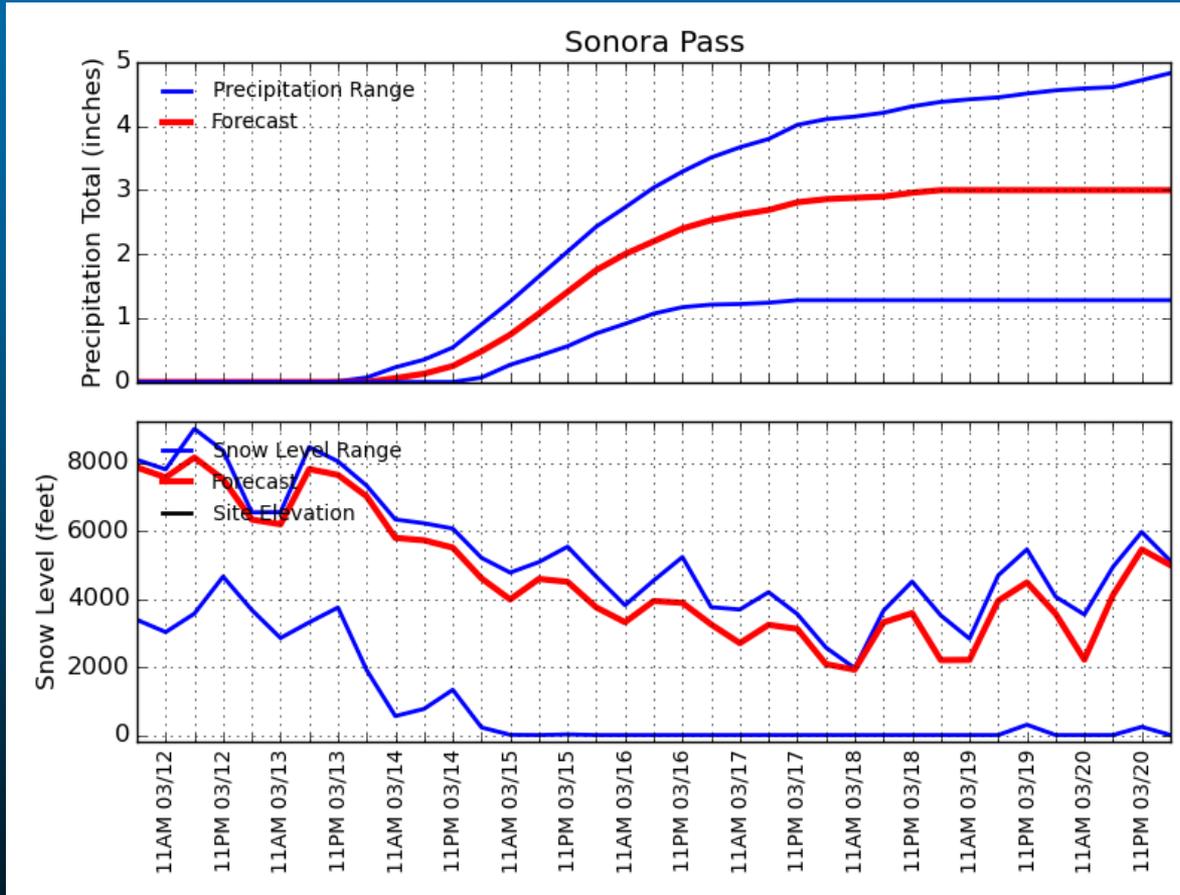


# Water & Snow Level Scenarios



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# Water & Snow Level Scenarios

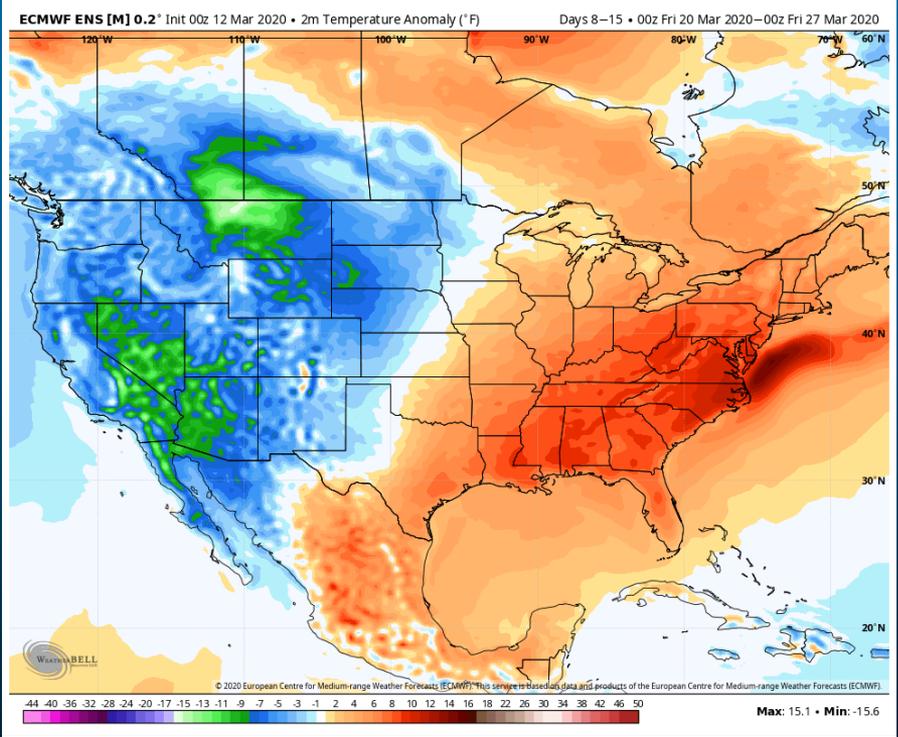
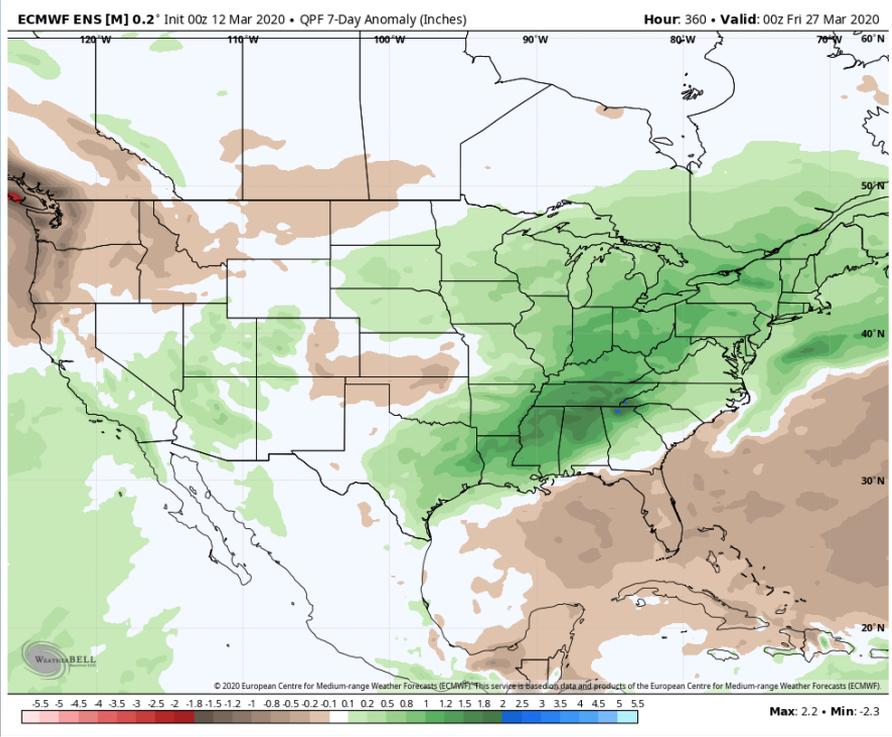


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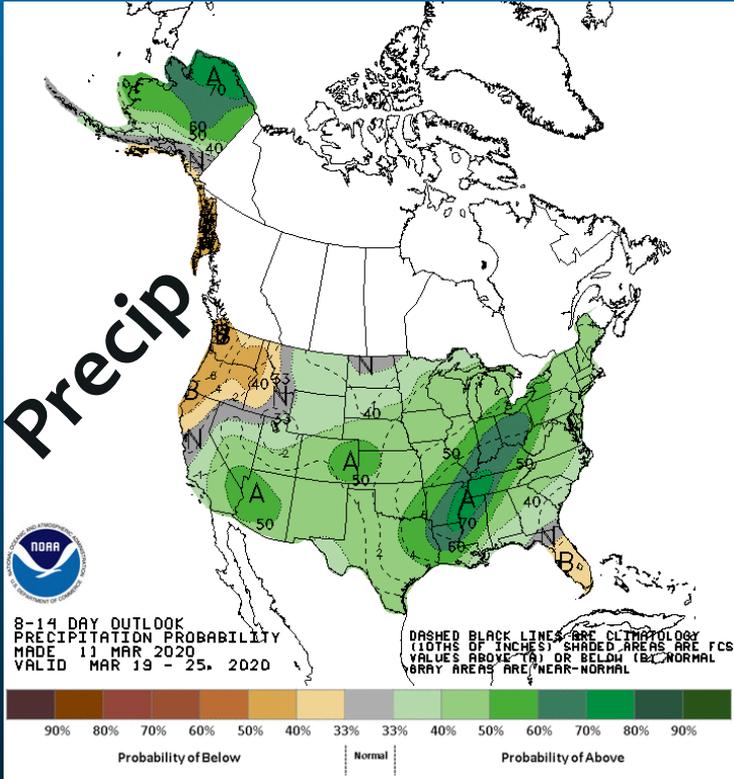
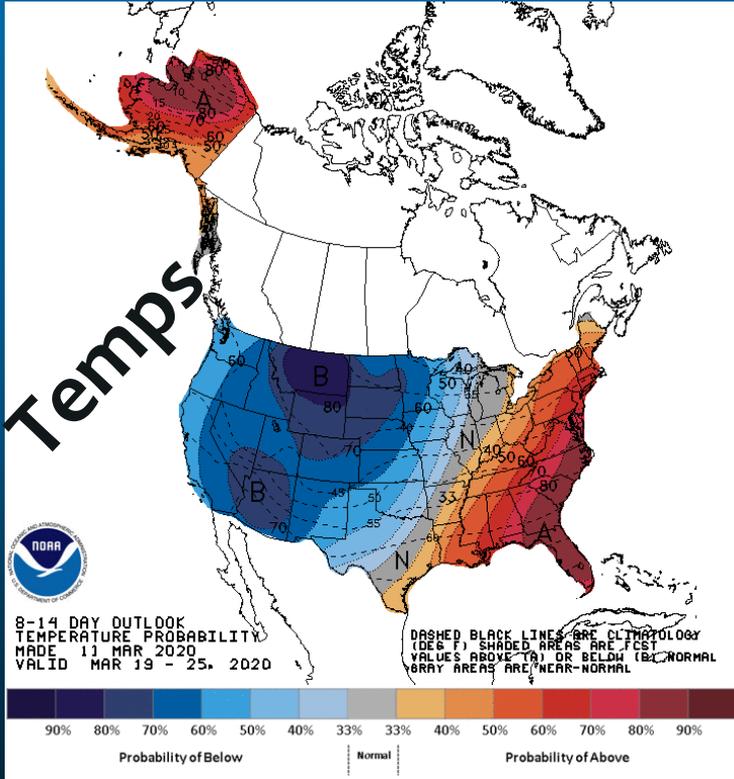


# So, How About Week Two?

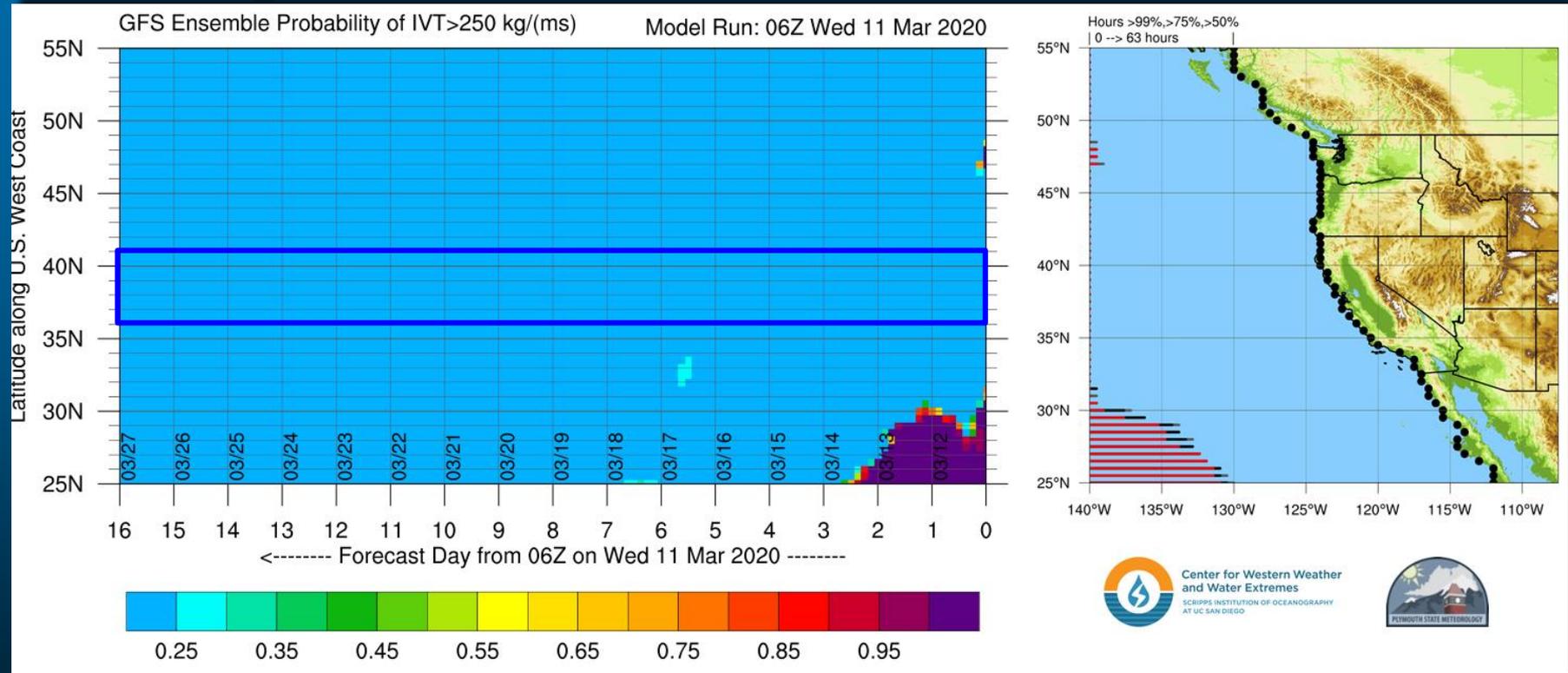
NOAA GFS Ensemble maps from WeatherBell.



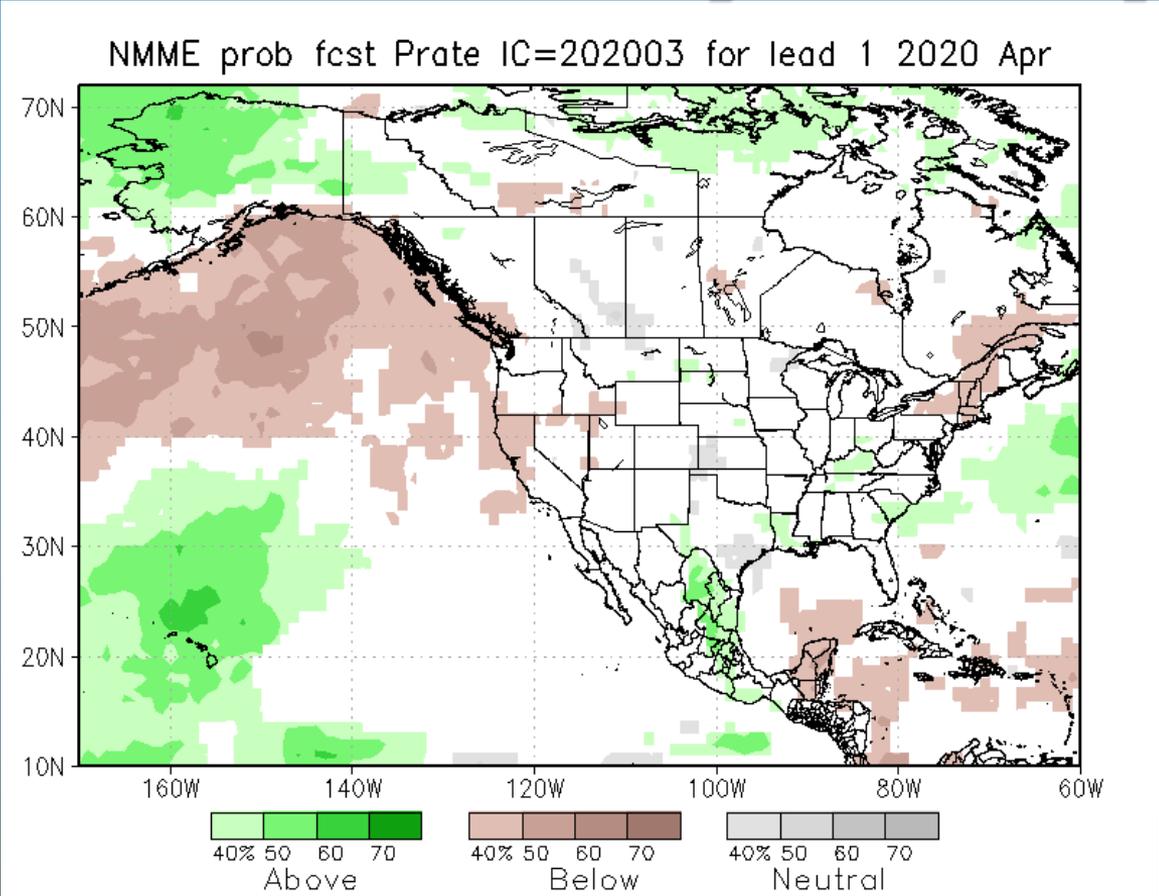
# So, How About Week Two?



# Atmospheric River Outlook



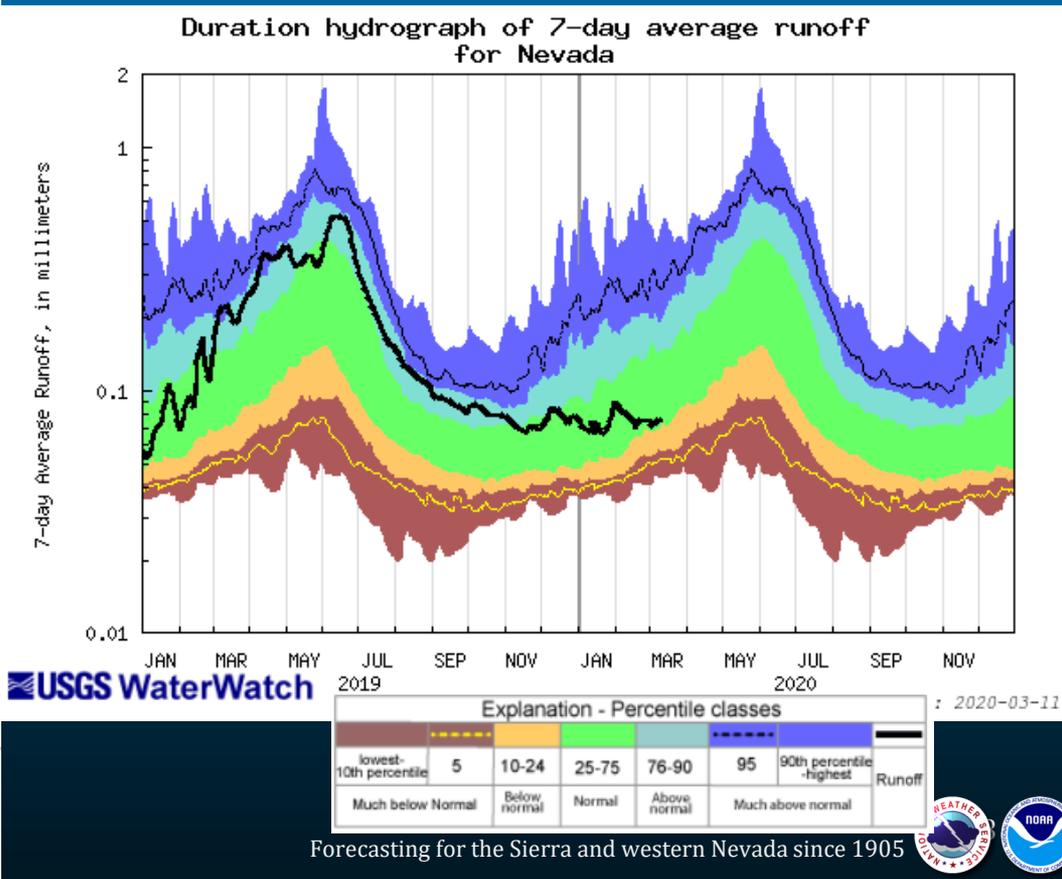
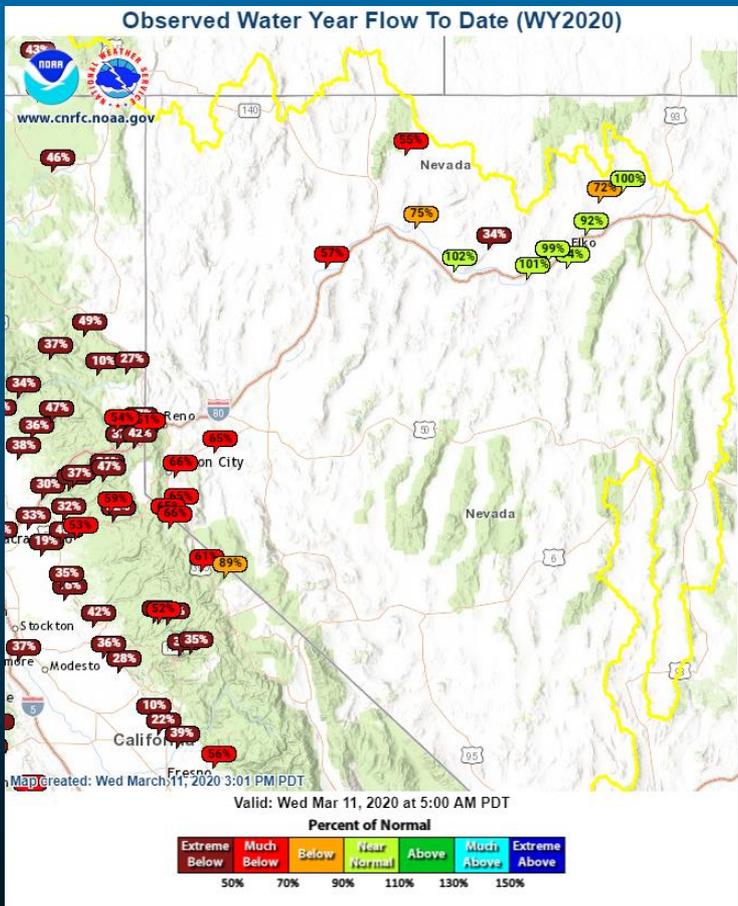
# Ensemble Model of April Precipitation



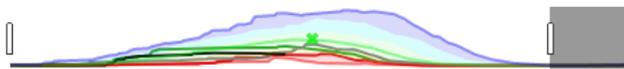
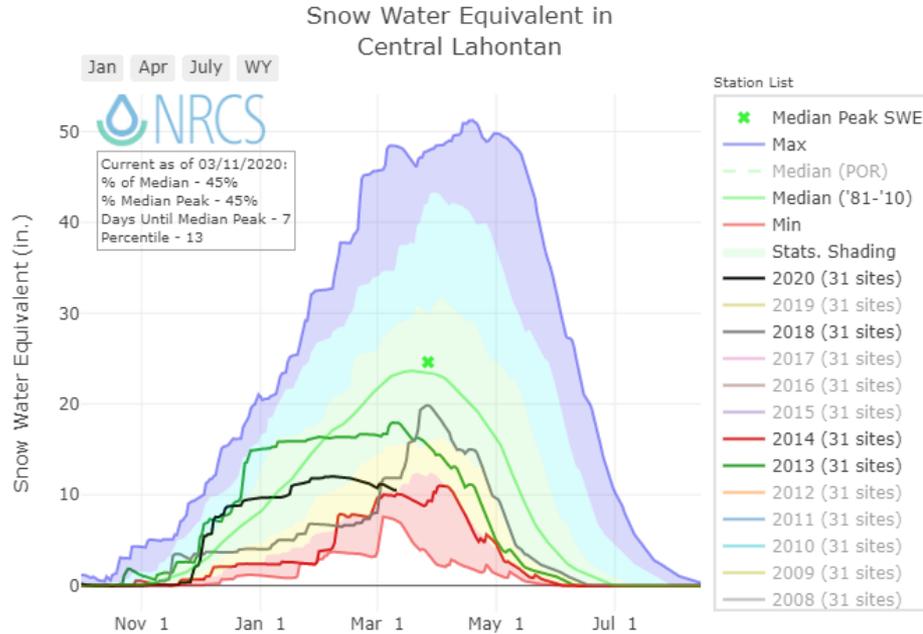
Reno National Weather Service  
Forecasting for the Sierra and western Nevada since 1905



# Water Year flow to date

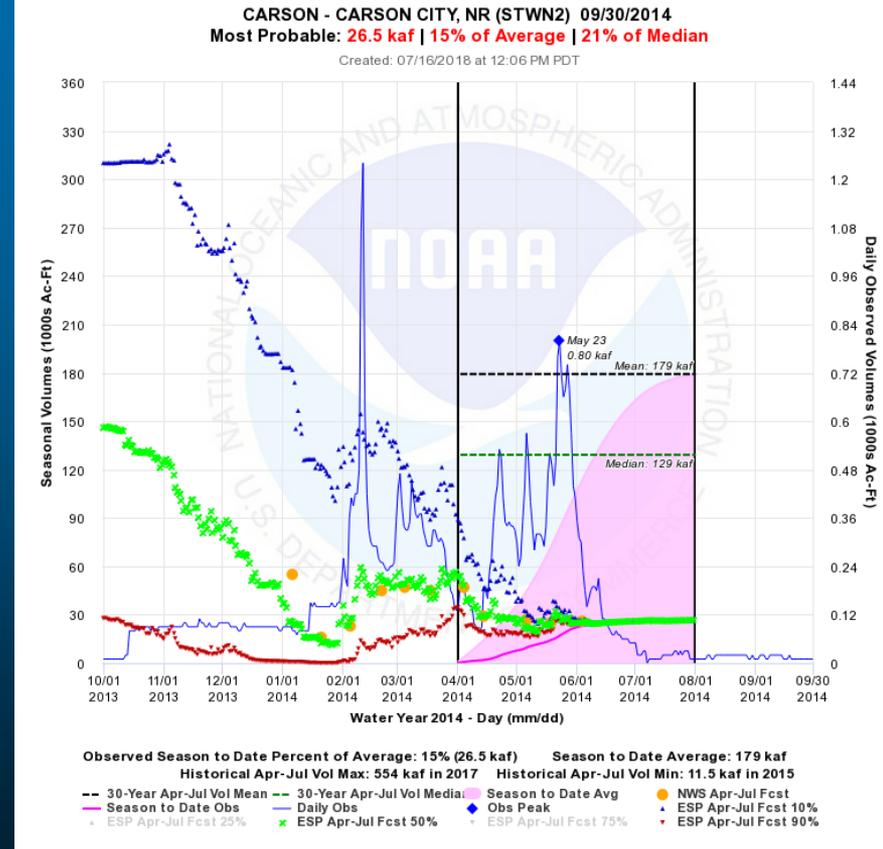


# Snowpack Analog years?

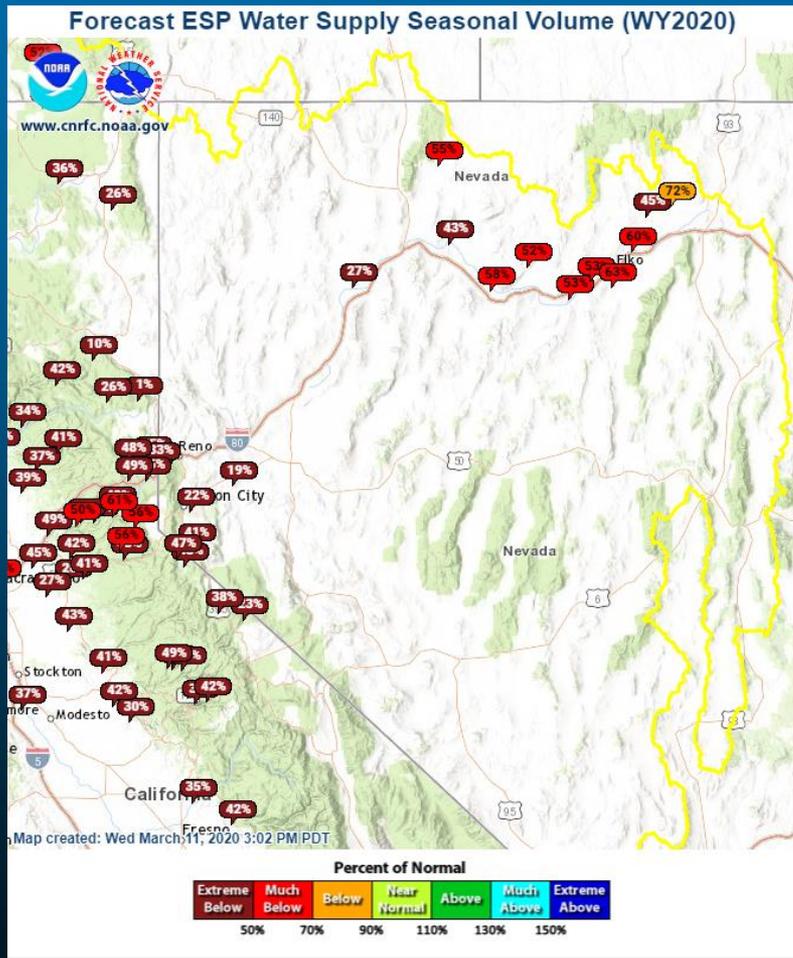


Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.

For more information visit: 30 year normals calculation description.



# Water Supply Count on Reservoirs, Not on Snowpack!



## RFC Page Demo

- April July plots and histograms
- Water year plots
- Previous year and verification plots
- Temperature and Precipitation forecasts

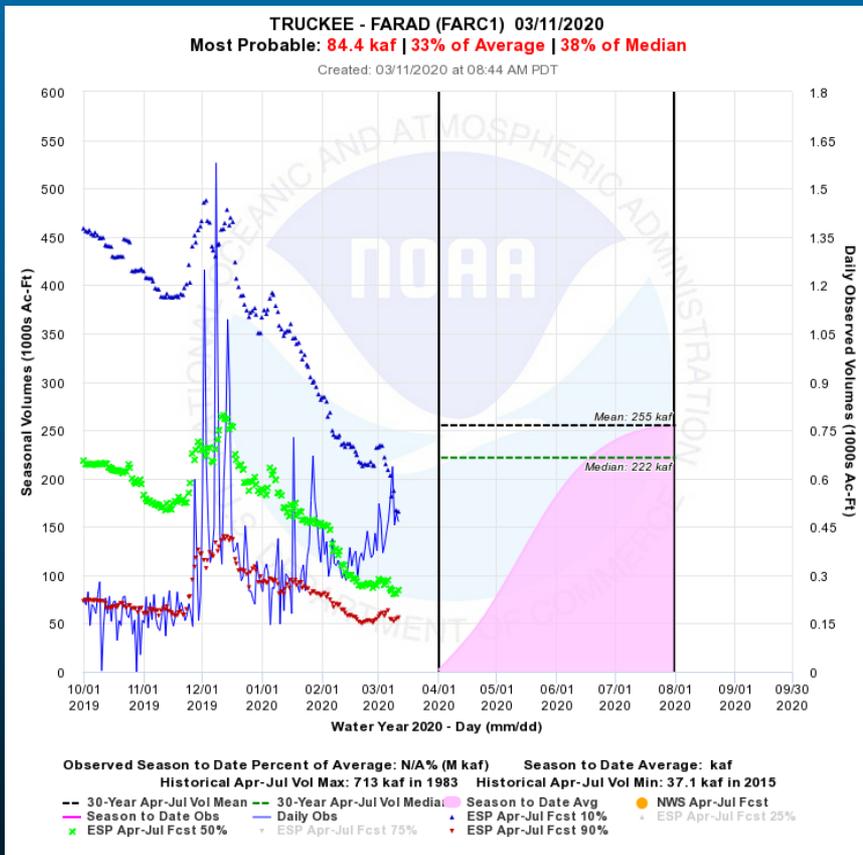


# Summary



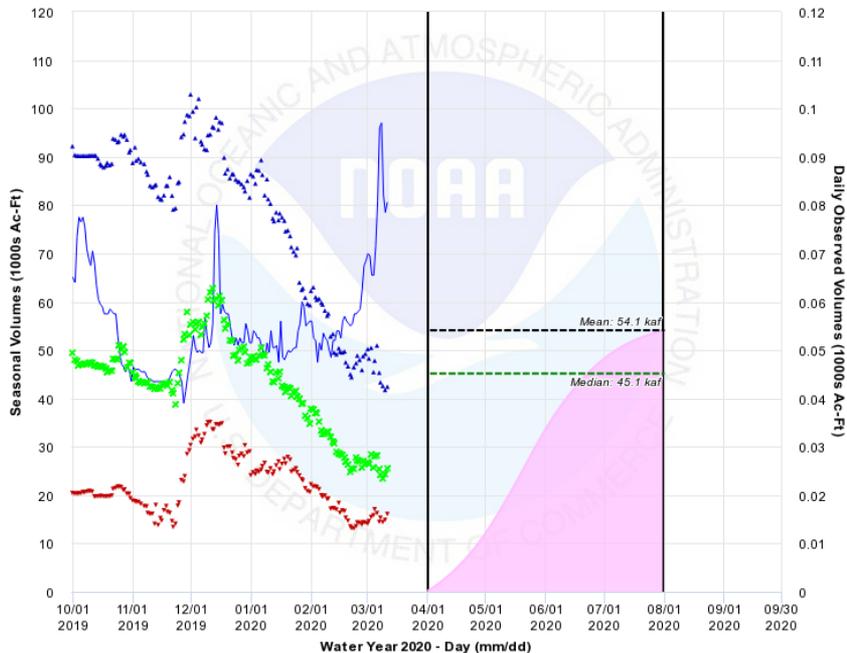
- Record to near record low January and February Precipitation.
- Snowpack in bad shape, especially sunny aspects and low elevations not well represented by measurement network
- CNRFC April-July Runoff ~20 to 50% of average, some improvement possible, but full recovery very unlikely.
- Decent storm on tap for the Weekend, and cool temps should minimize melt and minor boost to water supply.
- Spring Flood Risk is Low!

# Bonus Material



**WF CARSON - WOODFORDS (WOOC1) 03/11/2020**  
**Most Probable: 25.5 kaf | 47% of Average | 57% of Median**

Created: 03/11/2020 at 08:44 AM PDT

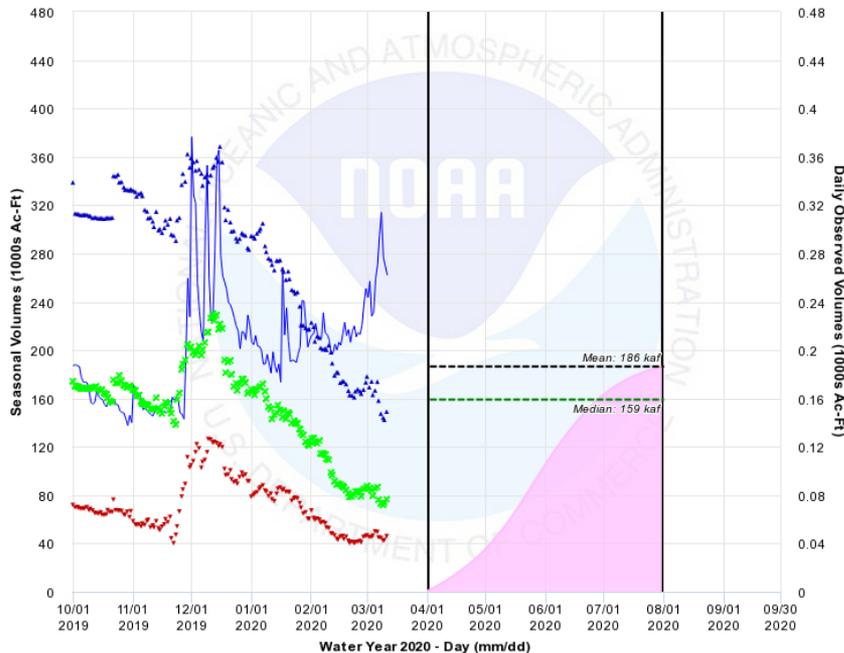


Observed Season to Date Percent of Average: N/A% (M kaf)      Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 131 kaf in 1983      Historical Apr-Jul Vol Min: 9.83 kaf in 2015

-- 30-Year Apr-Jul Vol Mean      - - - 30-Year Apr-Jul Vol Media      Season to Date Avg      ● NWS Apr-Jul Fcst  
 - - - Season to Date Obs      - - - Daily Obs      ● ESP Apr-Jul Fcst 10%      ● ESP Apr-Jul Fcst 25%  
 x ESP Apr-Jul Fcst 50%      ● ESP Apr-Jul Fcst 75%      ● ESP Apr-Jul Fcst 90%

**EF CARSON - GARDNERVILLE, NR (GRDN2) 03/11/2020**  
**Most Probable: 76.6 kaf | 41% of Average | 48% of Median**

Created: 03/11/2020 at 08:44 AM PDT



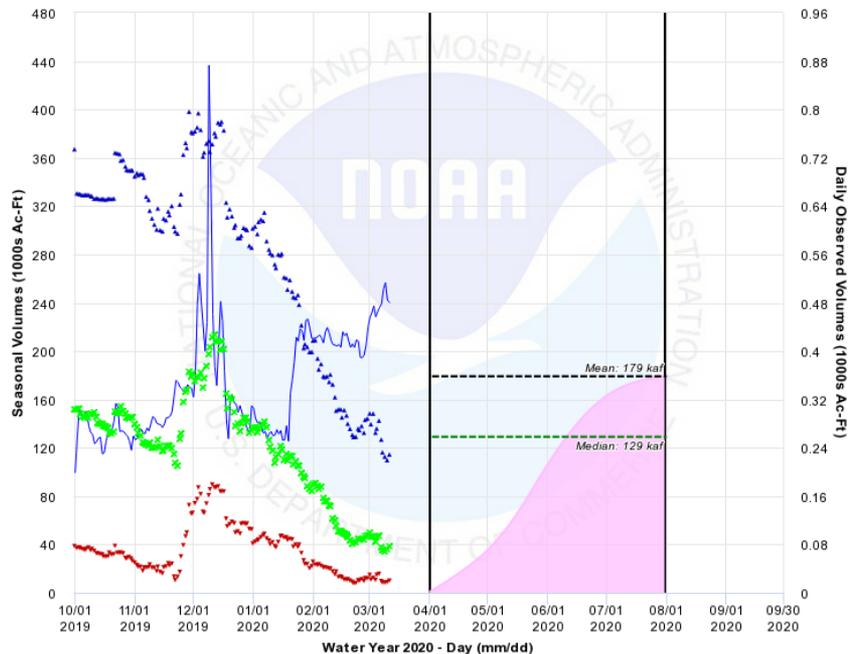
Observed Season to Date Percent of Average: N/A% (M kaf)      Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 509 kaf in 2017      Historical Apr-Jul Vol Min: 42.9 kaf in 1977

-- 30-Year Apr-Jul Vol Mean      - - - 30-Year Apr-Jul Vol Media      Season to Date Avg      ● NWS Apr-Jul Fcst  
 - - - Season to Date Obs      - - - Daily Obs      ● ESP Apr-Jul Fcst 10%      ● ESP Apr-Jul Fcst 25%  
 x ESP Apr-Jul Fcst 50%      ● ESP Apr-Jul Fcst 75%      ● ESP Apr-Jul Fcst 90%



**CARSON - CARSON CITY, NR (STWN2) 03/11/2020**  
**Most Probable: 38.5 kaf | 22% of Average | 30% of Median**

Created: 03/11/2020 at 08:44 AM PDT

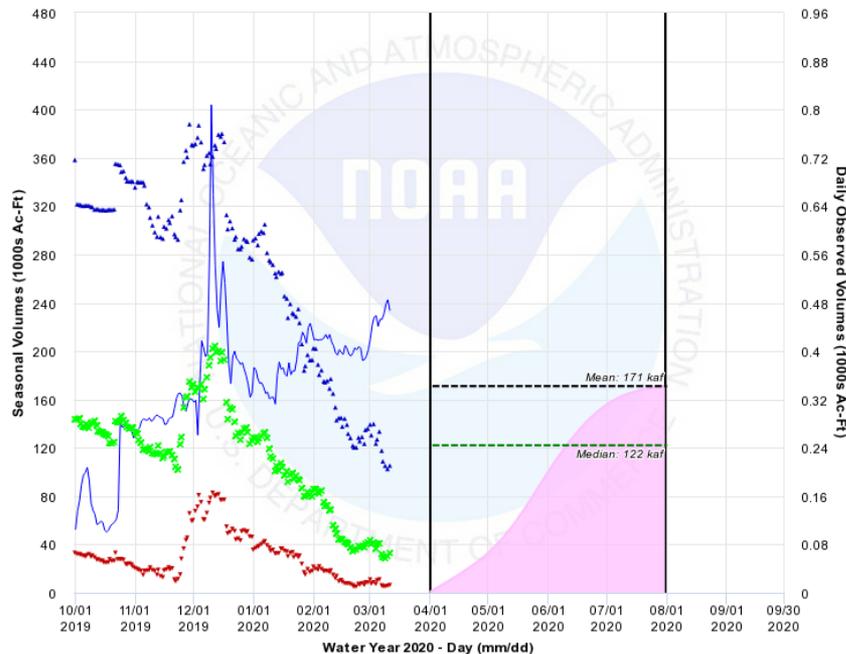


Observed Season to Date Percent of Average: N/A% (M kaf)    Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 554 kaf in 2017    Historical Apr-Jul Vol Min: 11.5 kaf in 2015

- 30-Year Apr-Jul Vol Mean    --- 30-Year Apr-Jul Vol Media
- Season to Date Obs    --- Season to Date Avg
- ESP Apr-Jul Fcst 10%    --- ESP Apr-Jul Fcst 10%
- ESP Apr-Jul Fcst 50%    --- ESP Apr-Jul Fcst 50%
- ESP Apr-Jul Fcst 75%    --- ESP Apr-Jul Fcst 75%
- ESP Apr-Jul Fcst 90%    --- ESP Apr-Jul Fcst 90%
- NWS Apr-Jul Fcst
- ESP Apr-Jul Fcst 25%

**CARSON - FORT CHURCHILL, NR (FTCN2) 03/11/2020**  
**Most Probable: 32.9 kaf | 19% of Average | 27% of Median**

Created: 03/11/2020 at 08:44 AM PDT



Observed Season to Date Percent of Average: N/A% (M kaf)    Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 552 kaf in 2017    Historical Apr-Jul Vol Min: 4.07 kaf in 2015

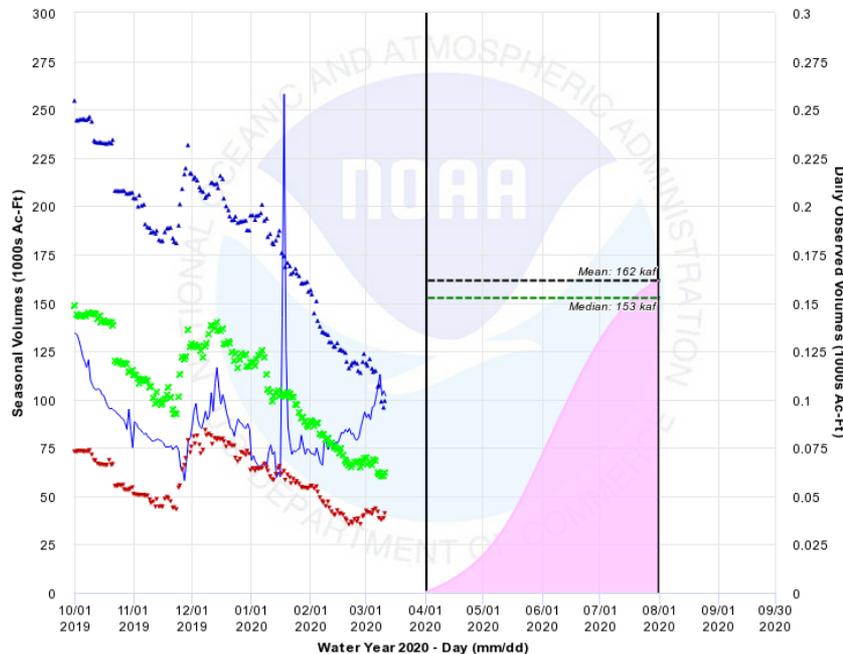
- 30-Year Apr-Jul Vol Mean    --- 30-Year Apr-Jul Vol Media
- Season to Date Obs    --- Season to Date Avg
- ESP Apr-Jul Fcst 10%    --- ESP Apr-Jul Fcst 10%
- ESP Apr-Jul Fcst 50%    --- ESP Apr-Jul Fcst 50%
- ESP Apr-Jul Fcst 75%    --- ESP Apr-Jul Fcst 75%
- ESP Apr-Jul Fcst 90%    --- ESP Apr-Jul Fcst 90%
- NWS Apr-Jul Fcst
- ESP Apr-Jul Fcst 25%



### WEST WALKER - LTL WALKER, BLO, COLEVILLE, NR (WWBC1) 03/11/2020

Most Probable: **62.2 kaf** | **38% of Average** | **41% of Median**

Created: 03/11/2020 at 08:44 AM PDT



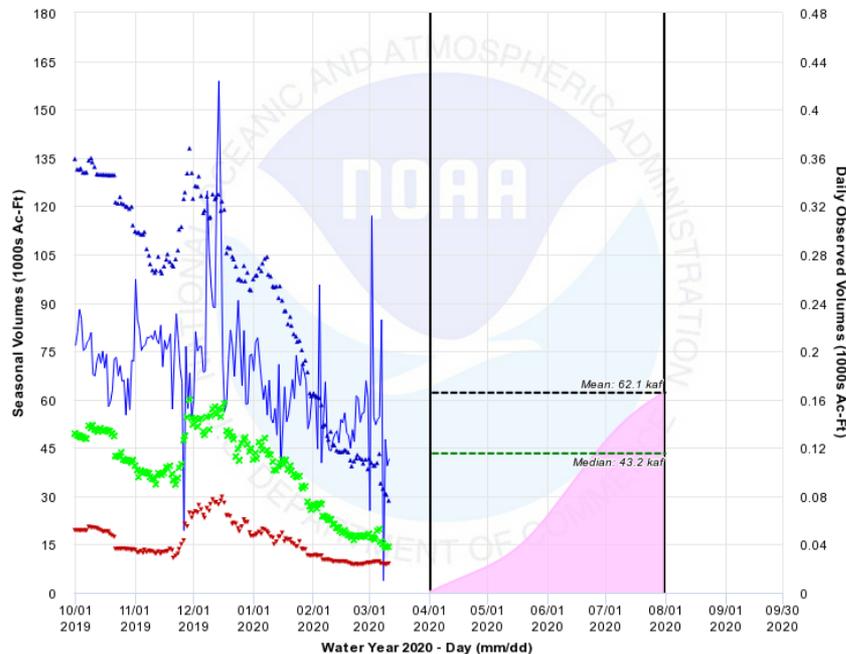
Observed Season to Date Percent of Average: N/A% (M kaf)      Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 410 kaf in 2017      Historical Apr-Jul Vol Min: 35.1 kaf in 1977

-- 30-Year Apr-Jul Vol Mean    - - 30-Year Apr-Jul Vol Media    Season to Date Avg    ● NWS Apr-Jul Fcst  
 - - Season to Date Obs    - - Daily Obs    ● ESP Apr-Jul Fcst 10%    ● ESP Apr-Jul Fcst 25%  
 x ESP Apr-Jul Fcst 50%    ● ESP Apr-Jul Fcst 75%    ● ESP Apr-Jul Fcst 90%

### EAST WALKER - BRIDGEPORT, NR (BPRC1) 03/11/2020

Most Probable: **14.3 kaf** | **23% of Average** | **33% of Median**

Created: 03/11/2020 at 08:44 AM PDT



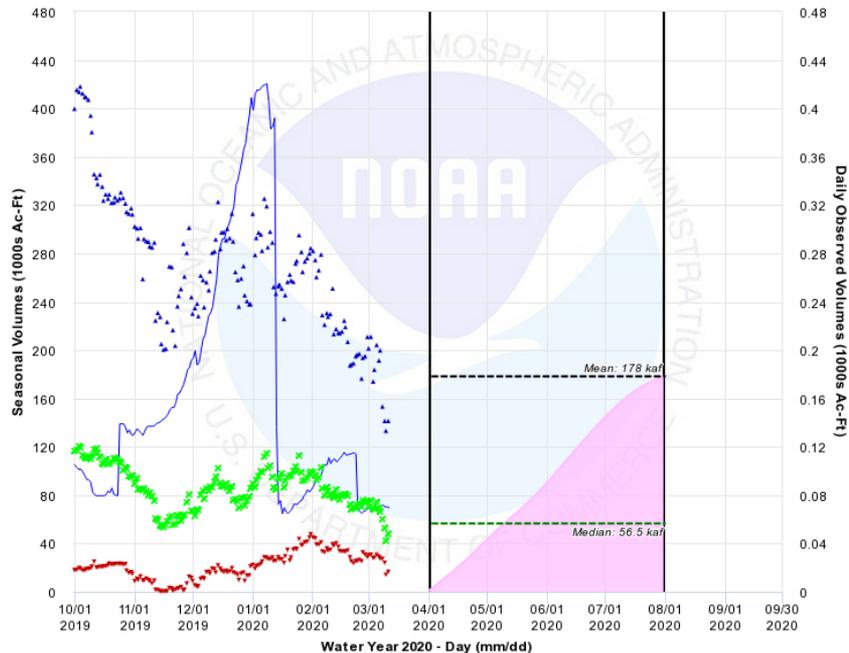
Observed Season to Date Percent of Average: N/A% (M kaf)      Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 209 kaf in 1969      Historical Apr-Jul Vol Min: 6.67 kaf in 1976

-- 30-Year Apr-Jul Vol Mean    - - 30-Year Apr-Jul Vol Media    Season to Date Avg    ● NWS Apr-Jul Fcst  
 - - Season to Date Obs    - - Daily Obs    ● ESP Apr-Jul Fcst 10%    ● ESP Apr-Jul Fcst 25%  
 x ESP Apr-Jul Fcst 50%    ● ESP Apr-Jul Fcst 75%    ● ESP Apr-Jul Fcst 90%



**HUMBOLDT - IMLAY, NR (HRIN2) 03/11/2020**  
**Most Probable: 48.0 kaf | 27% of Average | 85% of Median**

Created: 03/11/2020 at 08:49 AM PDT



Observed Season to Date Percent of Average: N/A% (M kaf)    Season to Date Average: kaf  
 Historical Apr-Jul Vol Max: 1110 kaf in 1984    Historical Apr-Jul Vol Min: 3.16 kaf in 2014

--- 30-Year Apr-Jul Vol Mean    --- 30-Year Apr-Jul Vol Median    ● Season to Date Avg    ● NWS Apr-Jul Fcst  
 --- Season to Date Obs    --- Daily Obs    ● ESP Apr-Jul Fcst 10%    ● ESP Apr-Jul Fcst 25%  
 × ESP Apr-Jul Fcst 50%    ● ESP Apr-Jul Fcst 75%    ● ESP Apr-Jul Fcst 90%



CARSON RIVER - FORT CHURCHILL (FTCN2) - 1 Day Chances of Exceeding River Levels  
 Latitude: -999.0 Longitude: -999.0  
 Forecast for the period 3/12/2020 24h - 7/31/2020 24h  
 This is a conditional simulation based on the current conditions as of 3/12/2020

